Indiana Department of Health

Update for Post-Acute Care Clinicians

July 2023

Spotlight

Testing for Urinary Tract Infections in nursing homes

Summary:
Urine dip, urinalysis, and culture remain the standard of care for diagnosing and treating urinary tract infections. There are new urine PCR tests on the market that have specific narrow uses and should not be used to replace traditional standard tests such as urinalysis and culture for standard testing and treatment. More studies are needed before adopting urine PCR as an initial test.

Background:
Urinary tract infection (UTI) is a common condition and is treated with antibiotics.[1] UTI is diagnosed based on symptoms, clinical findings and tests, such as urinalysis, microscopy and culture. When the clinical evaluation suggests UTI, empiric antibiotic therapy is started and if needed, the therapy is modified based on urine culture results.[2] The selection of antibiotics and the duration is determined depending on the symptoms, severity, and underlying medical conditions.[3 4]

Testing for UTI should be initiated based on systemic indications, like fever, and localizing lower or upper urinary symptoms, such as urinary urgency, frequency, dysuria, flank pain, etc. Symptoms, such as foul-smelling urine or concentrated urine, in the absence of other urinary symptoms/SIRS or change in mental status without urinary symptoms/SIRS should trigger an evaluation for other possible reasons also, especially in someone without an indwelling catheter.[5-8]

About 3-7% of healthy women and 25-50% of women in nursing facilities have asymptomatic bacteriuria.[9] Asymptomatic bacteriuria does not require antibiotic therapy other than in certain situations such as pregnancy or prior to urologic procedures.[9,10] Antibiotic overuse is common in hospitals and nursing homes and can cause harm, including side effects and C. difficile infections.[11] Inappropriate antibiotic also use can promote antibiotic resistance, hence antibiotic stewardship is essential.[11]

Newer diagnostic tests, such as urine Polymerase Chain Reaction (PCR), can yield results much faster than urine culture. PCR identifies bacterial DNA and can test for antibiotic resistance genes, but sensitivity information cannot be obtained from this test. However, the presence of antibiotic resistance genes was shown to have significant discordance from sensitivity results.[12] The urine PCR test has higher sensitivity than urine culture but lower specificity in diagnosing UTI.[2,13] Additionally, PCR could be substantially more expensive than standard urine tests. Like urine culture, urine PCR cannot differentiate asymptomatic bacteriuria from symptomatic infection.[14]

Urine PCR is not approved by the U.S. FDA for diagnosis of UTI.

Implications:

- PCR might identify organisms that may or may not necessarily be responsible for the symptoms.
- PCR detects DNA, but does not mean the presence of live organisms.[14]
- PCR test could stay positive after an infection was treated recently as non-viable DNA can continue to be detected.[14]

The urine PCR might have utility in select clinical scenarios. Even in these conditions, urine culture likely is still needed for sensitivity information.

Recommendations:

- Use traditional urine tests most of the time.
- Avoid using urine PCR routinely for diagnosing a UTI.
- Do not order this test in asymptomatic individuals.
- More studies are needed comparing the outcomes of using urine culture vs urine PCR before PCR can be used as a starting test.
- Urine PCR may be used in specific circumstances in consultation with specialists

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